American S. S. *West Carnifax:*

Gale began on the 17th. Lowest barometer, 29.31 inches on the 19th; position, latitude 43° 30′ N., longitude 39° W. End of gale on the 19th. Highest force of wind, 10; shifts of wind WNW.-NNW.

Danish S. S. *L. P. Holmblad:*

Gale began on the 17th. Lowest barometer, 28.46 inches at 8 a. m. on the 17th; position, latitude 57° 25′ N., longitude 21° 40′ W. End of gale on the 17th. Highest force of wind, 11; shifts of wind not given.

British S. S. *Rhode Island:*

Gale began on the 17th. Lowest barometer, 29.06 inches at 8 a. m. on the 18th; position, latitude 44° 40′ N., longitude 58° 35′ W. End of gale on the 18th. Highest force of wind, 10; shifts of wind SSW.-SW.-WSW.-S. by N.

Danish S. S. *L. P. Holmblad:*

Gale began on the 19th. Lowest barometer, 28.52 inches at 2 p. m. on the 19th. Position, latitude 56° 33′ N., longitude 27° 11′ W. End of gale on the 20th. Highest force of wind, 9; shifts not given.

American S. S. *Limon:*

18th, 7 a. m.; position, latitude 19° 37′ N., longitude 83° 39′ W. Moderate gale, heavy sea, rain squalls.
19th, 7 a. m.; position, latitude 23° 16′ N., latitude 83° 50′ W. Moderate gale, heavy sea, squally.
20th, 7 a. m.; position, latitude 25° 14′ N., longitude 80° W. Moderate gale, heavy sea, heavy rain squalls.

This gale must have been of limited extent, as vessels in the vicinity of the *Limon* reported light to moderate winds.

From the 21st to the 23d there was a moderate disturbance of limited extent in mid-ocean, as shown by the following storm log from the British S. S. *Malvern Range:*

Gale began on the 21st. Lowest barometer, 29.13 inches at 8 a. m. on the 21st; position, latitude 46° 50′ N., longitude 39° W. End of gale on the 23d. Highest force of wind, 9; shifts S. by W.-S.-NW.-N

On the 23d and 24th winds of gale force were reported from the region between the 20th meridian and the Irish coast, as well as on Nantucket shoals and in the vicinity of the Bermudas, while on the latter date vessels a short distance north of the Azores experienced moderate northerly gales.

The storm log from the American S. S. *Coldbrook* follows:

Gale began on the 22d. Lowest barometer, 29.74 inches at noon on the 22d; position, latitude 34° 45′ N., longitude 66° 21′ W. End of gale on the 24th. Highest force of wind, 9; shifts WSW.-SW.

On the 25th and 26th the conditions were comparatively featureless, as only a few reports were received from vessels in the steamer lanes denoting moderate gales.

On the 27th and 28th a severe disturbance of limited area swept the west coast of France, and on the 28th and 29th fresh northerly and northwesterly gales were also encountered in mid-ocean, between the 40th and 50th parallels. On the 28th there was a LOW central near Hatteras, and gales from the northeast prevailed i the northern quadrants and from the southwest in the southern.

On the 29th the center of this LOW was near latitude 36° N., longitude 58° W., and northeasterly gales were encountered by vessels between the 55th meridian and the American coast. The conditions in mid-ocean had changed but little since the previous day, as heavy weather still prevailed over the greater part of the steamer lanes on the 29th and 30th.

On the 30th, as shown on Chart XIV, unusually stormy weather for the latitude was experienced in the region between the Bermudas and the 45th meridian.

Storm logs covering the period from the 27th to the 30th are as follows:

British S. S. *Nitonian:*

Gale began on the 27th. Lowest barometer 29.16 inches at noon on the 29th; position, latitude 50° 26′ N., longitude 19° 06′ W. End of gale on the 30th. Highest force of wind 9; shifts of wind SE.-E.-N.-NW.

American S. S. *Carolinian:*

Gale began on the 28th. Lowest barometer 29.77 inches at 4 p. m. on the 28th; position, latitude 35° 52′ N., longitude 74° 28′ W. End of gale on the 29th. Highest force of wind 10; shifts 1 point to NE.

American S. S. *Collingsworth:*

Gale began on the 27th. Lowest barometer 29.38 inches at 4 a. m. on the 28; position, latitude 46° 20′ N., longitude 29° 40′ W. End of gale on the 29th. Highest force of wind 10; shifts W.-NW.

Italian S. S. *Duca degli Abruzzi:*

Gale began on the 29th. Lowest barometer 29.44 inches at 3.20 p. m. on the 29th; position, latitude 36° 30′ N., longitude 59° 30′ W. End of gale on the 29th. Highest force of wind 10; shifts not given.

NORTH PACIFIC OCEAN.

By F. G. TINGLEY.

The month of November opened with a typhoon approaching the Philippines from the direction of the Caroline Islands. During the period from the 1st to the 5th this storm moved in a WNW. direction across the Philippine Islands and the China Sea, reaching the Indo-China coast in the morning of the 6th. Particulars regarding this typhoon will be found in an article by Rev. José Coronas, S. J., Chief of the Meteorological Division of the Philippine Weather Bureau, on page 658.

The first information of this typhoon is contained in a report from the Dutch S. S. *Bali*, Capt. R. H. Brouwer, Balik Papan (east coast of Borneo), October 26, for San Francisco. On October 29, according to third officer and observer A. L. J. van der Moer, the weather became dull and bad, sky overcast with Ci. St. and Cu. from the south and passing showers. There was a long, moderate N. swell. The *Bali* at Greenwich mean noon of the 29th was in latitude 2° 53′ N., longitude 126° 10′ E., barometer 29.84 inches, wind SSE., 3. Changeable weather was experienced on the 30th, heavy showers alternating with periods of clear sky. The northerly swell continued, the barometer fell slightly and the wind veered to NW.

On the 31st the center of the typhoon passed to the northward of the *Bali*, the course of the ship having previously been changed to SSE. to avoid the center. The lowest barometer recorded was 29.49 inches (reduced and corrected), which occurred at 2 p. m. (l. m. t.) of November 1, the *Bali* being at that time in latitude 7° 28′ N., longitude 138° E. The highest force of the wind was 8–9, WNW. to WSW. The passing of the typhoon was accompanied by a high, wild sea and swell.

On the 3d, according to press reports, this storm caused the wreck of the Philippine coastwise steamer *San Basilic*, en route to Puerto Bello, Leyte Island, with the loss of 48 lives.

So far as known no vessels other than the ill-fated *San Basilic* were greatly involved in this typhoon. Several, however, were slightly under its influence at different times. The American S. S. *West Cadron*, Capt. F. E. Anderson, Honolulu for Manila (Nov. 5), was just coming under its influence on the 2d, having at 8 p. m. (l. m. t.) of that day a barometer of 29.52 inches, with a moderate NNW. gale and rough sea. The *West Cadron's* report ends here and it is not known how deeply involved in the approaching typhoon the vessel became.

On the 5th and 6th the British S. S. *Ixion*, Capt. R. N. Hodgson, Hong Kong for Manila, had a very high sea and heavy NE. swell. The *Ixion* was on the 5th upwards of 400 miles from the estimated position of the center of the typhoon.

This typhoon was closely followed by another, the track of which during the earlier part of its history can, however, only be conjectured. The first report of this second typhoon appears in a warning issued by the Japanese meteorological service on the 11th, in which the center was placed in latitude 21° N., longitude 126° E., depth 29.45 inches, direction N. During the 12th and 13th it moved in a northeasterly direction, the last warning issued placing the center at 6 a. m. of the 13th in latitude 34° N., longitude 146° E., depth 29.61 inches, direction ENE.

It is not improbable that this second typhoon had its origin in the same region as the first one mentioned, that is, near the Caroline Islands. On November 2 the S. S. *Bali*, which two days before had passed not far from the center of the first typhoon, experienced a high ENE. swell, the wind going to NE. and becoming strong. Heavy rain occurred between moments of absolutely clear sky, conditions identical with those as observed on October 30. In the *Bali's* report it is stated that the inference was that another typhoon was passing, this time to the southward. It would have been possible for a typhoon so located to travel in a northwesterly direction and appear to the east of Formosa on the 11th, where the second typhoon was discovered on that date.

While these typhoons prevailed in Asiatic waters conditions were very active in the higher latitudes of the North Pacific, although the reports at hand are not sufficiently numerous to permit of describing the situation over the entire ocean in detail. This activity continued throughout the remainder of the month and into December.

The outstanding features of these extratropical storms were the extraordinarily low pressures recorded in mid-ocean on the 13th and 14th and the intensity of the southwest gale which swept the American coast near the end of the month. This gale caused the wreck on the 26th of the Peruvian barge *W. J. Pirrie*, which went ashore near the mouth of the Quillayute River, and is generally considered to have been one of the worst in the history of the coast.

The British S. S. *Monteagle*, Capt. A. J. Hosken, Yokohama for Victoria, experienced heavy weather during much of the voyage, lasting from the 5th to the 21st. From the 13th to the 15th, during a strong gale, the ship's barometer showed abnormally low readings, 28.30 inches at 8 a. m. of the 14th, 28.12 inches at noon, 28.04 inches at 8 p. m., and 28.06 inches on the morning of the 15th. The *Monteagle*, during the time, was in latitude 50°–51° N., longitude, 170°–161° W. The lowest barometer observed was 27.98 inches. The correction for instrumental error of the barometer, an aneroid, is −0.13 inch, which would make the lowest pressure 27.85 inches. Press reports of the *Monteagle's* voyage state that this was the lowest barometer within the memory of the oldest officer aboard.

On the 14th the Japanese S. S. *Manila Maru*, Capt. T. Somekawa, also from Yokohama for Victoria, when in latitude 50° 19′ N., longitude 162° 6′ W., recorded a barometer reading of 27.70 inches. The correction for the barometer used, an aneroid, is +0.11 inch, which makes the actual pressure 27.81 inches.

At Dutch Harbor (latitude 53° 30′ N., 166° 55′ W.), the pressure at the morning observation on the 15th was 28.46 inches. Lower readings have been recorded at that station on several occasions since its establishment in 1911. The lowest reading of record is 27.68 inches, reported as occurring in the afternoon of November 16, 1912.

While these abnormally low pressures were being recorded on the North Pacific, correspondingly low readings were being made in the North Atlantic, the Danish S. S. *H. P. Holmblad*, reporting a barometer of 27.86 inches on the 14th, when in latitude 58° 30′ N., longitude 15° 10′ W. Reference thereto will be found in the report of weather of the North Atlantic Ocean.

There had been some recovery in pressure in the Aleutian area following the great depression of the 14th and the 15th and at Dutch Harbor readings were slightly above normal from the 17th to 19th. By the 21st, however, the barometer had fallen to 29.04 inches and at the evening observation of the 23d to 28.94 inches. At this time there was a single depression overlying the Aleutian Islands. On the morning of the 24th two centers appeared, one over the Gulf of Alaska, another centered near Dutch Harbor. This condition held throughout the 24th, but had disappeared by the morning of the 25th, when the weather map showed a single center over the eastern part of the Gulf of Alaska, the point of lowest pressure being Sitka with a barometer of 28.82 inches. During the 25th, 26th, and 27th this depression developed to the southeastward causing dangerous southeast to southwest gales on the American coast during the 26th and 27th, reaching a velocity of 93 miles an hour from the south at Tatoosh Island at 3.25 p. m. of the 26th, exceeding all previous records at that station. A velocity of 68 miles from the south was recorded at North Head on the same date.

CHARTS OF TYPHOON TRACKS.

In the section devoted to charts in this issue of the REVIEW will be found charts of typhoon tracks in the Far East for the months of May and June, reproduced from Atlas of the Tracks of 620 Typhoons, 1893–1918, by Louis Froc, S. J., Director Zi-ka-wei Observatory, Shanghai, China.